WHAT IS CLAIMED IS:

1. A method for predicting natural frequency responses in tube sub-systems including shrouded bellows components, said method comprising the steps of:

determining a stiffness multiplier from input values; and

using the determined stiffness multiplier in a model to predict a natural frequency response.

2. A method in accordance with Claim 1 further comprising the step of inputting dynamic system operating inputs into the model.

3. A method in accordance with Claim 2 wherein said step of inputting dynamic system operating inputs further comprises the step of inputting at least an operating pressure and vibratory environment into the model.

4. A method in accordance with Claim 2 further comprising the step of inputting geometry inputs including at least one of a bellows pitch and a mating tube diameter into the model.

5. A method in accordance with Claim 3 wherein said step of determining a stiffness multiplier further comprises the step of using a regression technique to determine the stiffness multiplier.

6. A method in accordance with Claim 3 further comprising the step of determining system stiffness as a function of the stiffness multiplier.

7. A modeling system for determining natural frequency response of shrouded bellows components, said system configured to determine a stiffness multiplier from input values.

8. A modeling system in accordance with Claim 7 wherein the stiffness multiplier is used to determine the natural frequency response.

9. A modeling system in accordance with Claim 8 wherein the input values include at least one of shrouded bellows geometry inputs and dynamic operating condition inputs.

10. A modeling system in accordance with Claim 8 wherein the bellows geometry inputs include at least one of a tube sub-system diameter and a bellows pitch.

11. A modeling system in accordance with Claim 8 wherein the dynamic operating condition inputs include at least an operating pressure.

12. A modeling system in accordance with Claim 8 wherein the stiffness multiplier is adjustable such that a dynamic stiffness of the shrouded bellows is selectively variable.

13. A modeling system in accordance with Claim 8 wherein the stiffness multiplier is determined using a regression technique.

14. A system for determining natural frequency response of shrouded bellows components, said system comprising a model configured to predict the natural frequency response as a function of a stiffness multiplier.

15. A system in accordance with Claim 14 wherein said model further configured to determine the stiffness multiplier from input values

16. A system in accordance with Claim 15 wherein the input values include at least one of shrouded bellows geometry inputs and dynamic operating condition inputs, the shrouded bellows geometry inputs including at least one of a tube sub-system diameter and a bellows pitch, the dynamic operating condition inputs including at least an operating pressure.

17. A system in accordance with Claim 14 wherein the stiffness multiplier is adjustable such that a dynamic stiffness of the shrouded bellows is selectively variable.

18. A system in accordance with Claim 14 wherein the stiffness multiplier determined using a regression technique.

19. A system in accordance with Claim 18 wherein the regression technique comprises a regression equation.